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HIGHWAY PROGRESS REPORT 1954 -1964

PROGRESS REPORT

1954 - 1964

NEW JERSEY STATE HIGHWAY DEPARTMENT

New Jersey State Highway Department

Progress Report 1954-64

During the decade since January 1, 1954, the production and other activities of the New Jersey State Highway Department have increased and diversified to a degree unmatched in any comparable period in its history. To handle these many additional responsibilities, it has been necessary for the management of the Department to institute some rather sweeping changes in every phase of the Department's operations. Much remains to be done and always will, however, the accomplishments to date provide a solid base upon which to build for the future. The demands of our State's expanding economy can be met in no other way.

SUMMARY

Highway Construction

1. The amount of money obligated for new highway projects has risen to a level of more than $100 million in each of the past three completed fiscal years, with approximately $120 million projected for 1963-64. This compares with approximately $35 million activated during the 1953-54 fiscal year.

2. Annual cash expenditures for the various phases of State Highway construction exceeded $100 million for the first time in the State's history in 1962-63.

3. More than 76 miles of highway projects are presently under construction with an original contract value of more than $112 million. Total outstanding obligations February 29, 1964, including engineering, purchase of right-of-way, public utility rearrangements and construction, amounted to more than $162.6 million. This compares with approximately $36 million as of June 1954.

Highway Construction, cont'd.

4. Since the end of 1953, the Department has completed more than 839 miles of contract construction projects of all kinds, which included some work, of course, necessary to improve a highway's safety in one way or another without adding to its capacity.

Highway Engineering

1. In designing the modern highways required by today's traffic volumes, the Department has abandoned the outmoded concept of "traffic circles" in favor of Channelized Intersections, Jughandle Turns and Overpasses. The construction of these complex interchanges is a major cost item, particularly in urban areas, but in no other way can dangerous turning movements be avoided.

2. Due to improved engineering methods and construction materials, it has been possible to reduce the thickness of rigid pavements in many instances without sacrificing strength. This has helped hold construction costs down.

3. Flexible pavements, employing bituminous concrete, have been designed to conform with geologic sub-surface soil characteristics. Combined with use of a stronger and more durable base this has made it possible to utilize flexible pavements, at less cost, on more highways than in the past.

Highway Engineering, cont'd.

4. The Department is now experimenting, in cooperation with the Federal Bureau of Public Roads, to determine the value of "composite pavements" - flexible surfacing on a rigid base. The experiments include several test installations.

5. The standard lane width has been increased, shoulders have been widened and hard-surfaced, grades and curves have been eased and adequate lighting introduced at intersections and other hazardous points.

6. The Department developed the concept of low-level bridge lighting and installed its and the world's first such system on the Manahawkin Bridge with conspicuous success. As a result, it was also installed on the new Route 3 bridge across the Hackensack River and will be utilized on Interstate Route 280 in the vicinity of First Mountain, West Orange. This innovation is now being carried out by other Highway Departments.

7. An Engineering Computer Bureau was established late in 1962, utilizing an IBM 1620. Use of this equipment has speeded the solution of many engineering and analysis problems.

Maintenance

1. The Division of Maintenance and Operations was placed on a decentralized, District basis in 1962, thus allowing speedier decisions in the field.

Maintenance, cont'd.

2. A statewide two-way radio network was set up to improve efficiency and "increase" the work force of maintenance, electrical and equipment activities.

   There are eight base transmitting and receiving stations and 254 mobile units. Mobile installations include maintenance foremen and supervisors' cars, electrical maintenance trucks, equipment and road mechanics' cars and radio maintenance vehicles.

3. Encroachments on State Highway rights-of-way had become a tremendous problem over the years, with the number reaching 10,000 or more. Better than 4,000 have now been removed under a program of continual policing.

4. Winter Driving - The Department has placed special emphasis on snow and ice control. Each year has seen vast improvements in both operational methods and equipment. The total snow fighting force consists of approximately 2,000 pieces of equipment and 2,500 men fortified by the radio network. This enables the forces to be shifted on a moment's notice. In 1958-59 the Department used rock salt on a state-wide basis for the first time in the control of icy pavements. This materially improves the effectiveness of "Operation Snow" and reduces the annual springtime cost of cleaning abrasives from our roadways. By converting existing equipment from cinder spreading to salt spreading, purchases of special

equipment amounting to many thousands of dollars were avoided. In 1960-61, the Department conducted seminars on snow removal problems throughout the State, resulting in improved local action in keeping streets and highways open during storms.

State Aid

1. On January 1, 1964, the Division of State Aid was decentralized into four districts. This was accomplished in order that the basic work in the several areas of the State could be handled in a more expeditious manner.

Signs

1. The thousands of signs along New Jersey's highways were revised through comprehensive and continuous review under both day and night conditions. This has provided greater service to motorists through simpler legends, fewer names and larger signs. Compass directions were placed on route markers to enable motorists to identify travel direction.

A sign research program was established and a continuing state-wide sign cleaning procedure instituted. In the interest of national uniformity standardized route markers for State and Federal routes were developed through a cooperative venture under the American Association of State Highway Officials with New Jersey participating. We are now in process of placing these markers throughout the State as a 5-year project to minimize the cost factor. "No Litter" signs were erected on a state-wide

basis with noticeable lessening of the amount of litter maintenance people had to pick up. Both improved appearance and safety were some of the dividends.

2. In order to determine the most efficient type of roadside delineators, top staff members made extensive night tests on the many highways throughout the State. These tests made possible for the first time direct comparisons between many types of reflectors.

3. In the interest of greater safety at night, the policy of making all signs on state highways either reflecting or illuminated was established.

4. Large (six-foot double-faced) SPEED LIMIT signs were placed at five mile intervals on divided highways to replace smaller signs previously placed at one-mile or less intervals. This produced a saving by making one sign do the work of ten or more smaller ones.

   Enforcement authorities, including the State Police, have been enthusiastic in their praise of the larger and simpler signing.

5. A "Welcome to New Jersey" sign featuring an accurate replica of the Great Seal of the State of New Jersey was designed and placed at all interstate crossings.

6. Overhead remote-controlled signs were developed and installed at appropriate locations to warn motorists of traffic signals ahead of time.

7. The development of directional signs at multi-lane interchanges included construction of a 178-foot bridge on Interstate Route 295 near Camden, at the time the largest in the nation.

Planning

The Department developed a Master Plan in 1956 for future construction based on estimated traffic requirements in 1975. It included additions to and improvements of the present state system at a then estimated cost of $2-3/4 - 3 billion dollars in construction deemed necessary to the continued growth of our State.

This plan was reviewed by the Commissioner and members of his staff with Legislators, Freeholders, Planning Boards and local officials in a series of meetings in each of the 21 counties. The purpose of these visits was to permit coordination by others with the overall planning of the Department marking the first time such local conferences were undertaken on a state-wide scale.

The most recent estimate shows approximately $2 billion of the original Master Plan (with some revisions) still to complete. With highway planners now thinking in terms of 1984 needs, some increase in cost can be expected.

Safety Construction

Accidents have been reduced and lives saved by the introduction of many improvements in design of both new and old highways. Chief among these features are the following:

1. Barrier curbs to eliminate head-on collisions - 133 miles constructed since 1954.

2. Creeper lanes for use by slow-moving vehicles on long steep grades - 35 built since 1954.

3. Jughandles for left turns - 355 units in the same period.

4. Stabilized and widened shoulders to provide safe off-the-road stops and reduce maintenance costs by eliminating periodic scraping.

5. Bordering white reflecting lines have been painted on the outer edges of all state highways to delineate the pavement edge at night. New Jersey was the first state to adopt and complete this program.

6. Wire mesh fencing installed on overpasses to prevent children from climbing on balustrades.

7. Constructed 394 overpasses to eliminate grade intersections for pedestrian and vehicular travel.

Safety Construction, cont'd.

8. Established a continuing program for closing center island openings to reduce accidents caused by the "overhang" of vehicles.

9. Curves on all new highways being super-elevated (banked) for greater safety.

Administration

1. Standard Operating Procedures to insure uniform interpretation of all Departmental operations have been established and maintained.

2. Rigid controls covering use and operation of Department-owned vehicles have been put into effect. As a result, the private use of state cars was eliminated and through more efficient assignment the passenger car fleet was reduced from 352 to 278. Sixty excess cars were sold and 12 others assigned to other State Departments. Operating expenses of the fleet were reduced by $4,000 a month.

3. The jungle of forms used by the Department (the outgrowth of 35 years) was reviewed and revised. Many were eliminated and some new ones created which materially reduced interoffice correspondence.

Administration, cont'd.

4. The former practice of retaining 10% of the bid price of a job until final approval of the completed project was changed to retention of 10% through the first half of the job and no retention thereafter. This ties up less of the contractor's working capital with the State adequately protected.

5. To meet the demand for experienced contractors, the Department revised tests and pre-qualification ratings, placing greater emphasis upon past performance. By up-grading this element of "pre-qualification" the Department was able to cash in not only on a contractor's ability and character performance, but his adherence to meeting a contract schedule.

6. Perpetual inventories were established and stock orders placed on a quarterly rather than yearly basis, reducing required storage space and the amount of money tied up in materials.

7. Progress boards were developed to replace written reports from construction and real estate divisions. Photos of these boards are sent to the staff at 2-week intervals. Information relative to construction progress is thereby placed at their disposal on one sheet rather than with volumes. In addition to main control boards in administration headquarters, specialized boards are used in the road, bridge, planning, real estate, legal and personnel divisions.

Administration, cont'd.

8. Uniform observance of hours for beginning and ending the working day was obtained by sounding a gong signal. This practice has done away with people using their own determination of the working day. In addition, cafeteria hours were set at 8 a.m. to 8:45 a.m. and 11:30 a.m. to 1:45 p.m. to discourage continuous "coffee breaks".

9. In the interest of efficient conservation of storage space, a procedure was set up for the disposal of useless and obsolete records in conformity with state regulations. In a single month seven tons of such records were disposed of and the space released utilized to overcome office crowding. This also reduced the need for purchase of new storage cabinets.

10. Organization charts of the Department showing the responsibility and necessary personnel of all divisions, bureaus, and sections of the Department were edited and brought up to date in line with new and added functions.

11. Regular staff meetings were instituted and this procedure encouraged throughout the Department.

12. Investigation and the preferring of charges against dishonest employees was placed on a basis of constant vigilance by a trained staff with the result that quite a number have been separated from their jobs.

Administration, cont'd.

13. All State Highway cars were painted a bright yellow to make them conspicuous and discourage their use for personal jaunts.

14. Construction and materials specifications were revised for the first time since 1941. All suppliers were sent drafts of portions of interest to them for their consent and review prior to adoption.

15. Accounting procedures were mechanized, particularly with reference to Federal Aid construction projects, and New Jersey became the first State on the eastern seaboard and the fourth in the Nation to satisfy the Federal Government's requirements for "concurrent audit" involving much faster reimbursement for construction expenditures. A firm of national repute was engaged to review all phases of our accounting procedures and financial reports. Partly as a result, a Bureau of Data Processing was created in 1963.

Public Information

In almost direct proportion to increased construction activities there has been a surge in the demands for information. To meet this our informational program has broadened its approach. The traditional "news release" technique has been expanded and supplemented by a series of 5-minute thrice-weekly radio programs over 29 New Jersey and nearby stations, regular public speaking engagements before service clubs, "home produced" informational printed materials of professional quality, and "on-the-job" information centers at project sites among other activities.

Fernwood Equipment Depot

1. The Fernwood Plant was expanded and reorganized to obtain more effective layout and efficient operation. New buildings were constructed here and at outlying locations. Reassignment of space resulted in less crowding and storing of more equipment under cover.

2. Plant security was increased through additional yard lighting; continuous watch service signaling system for fires; new fencing and restriction of certain areas. This reduced insurance costs materially.

3. An accumulation of junk dating back to 1918 was sold and rigid procedures established in the disposal and classification of scrap.

4. A survey was conducted to remove obsolete materials and parts, some of which had been in storage since World War I. Following an inventory, they were offered for sale under competitive bids. Unsold material was scrapped. This procedure was extended to include parts stocked in field depots and in the Electrical Bureau.

Personnel

1. A Departmental dispensary and two first-aid rooms for use by employees was set up in the Trenton headquarters -- the first in the State.

   An average of 300 persons a month receive treatments for ailments ranging from minor indispositions to major accidents. Prior to

the establishment of the dispensary under the full time supervision of a registered nurse, these people had to go elsewhere for treatments with the result that absence from work was common. Such absence was further curtailed by addition of a visiting nurse to the staff.

2. A broad training program for new employees and others to better qualify them for their present jobs and future advancement was set up. This includes the training of many engineers from foreign countries sent us each year by the U.S. State Department.

3. The practice of employees receiving gifts and entertainment from purveyors of services and supplies was completely abolished. All persons doing business with the Department and all employees are reminded of this each year at the holiday season.

4. All references to race and color on Personnel Forms were eliminated and non-discriminatory employment practice established.

5. The use of free State railroad passes by Highway Department personnel was terminated.

6. In 1954 a recruitment program was instituted. Under this program, first in State Government, representatives of the Department visited the campuses of leading colleges and universities to interest engineering graduates in careers in the Highway Department. This program, carried on in direct competition with private industry, has been unusually successful and has placed in state service many qualified young men.

Personnel, cont'd.

7. Office Christmas Parties were abolished because of the unfavorable reactions on the part of many of the families of our people and the general public. In their stead, the Commissioner has given a Children's Christmas Party and gifts for some hundreds of children and grandchildren of the Department each year.

8. There has been progressive improvement in bettering the wage scales of our three grades of hourly employees: Laborers, Semi-skilled and Skilled workers.

At the outset of this administration the laborer had a $1.26 minimum hourly wage. It required five years of service, receiving one 6¢ increment each year, to reach a $1.56 maximum hourly wage. The same type of employee now enters with a $1.82 minimum hourly wage and four years later reaches his maximum of $2.22 This is about a 30 per cent increase at each end.

The Semi-skilled range has been boosted from a $1.32 minimum and $1.62 maximum to a $1.92 minimum and a $2.32 maximum in four years. This is about a 40 per cent increase in the minimum and a 25 per cent increase in the maximum.

All skilled workers, who had a range of $1.74 to $2.04 in 1954, are now on the salaried payroll.

Right-of-Way

1. On Interstate construction, a policy of using Title Companies to clear titles, rather than enlarge the Department's own Title Bureau was established. By using these specialists the property owner can get a much quicker settlement than would otherwise be the case -- frequently within a week.

2. The practice of holding meetings in various municipalities to explain the Department's policy and procedures in the acquisition of rights-of-way was instituted. At these meetings property owners are provided with answers to practically all of their questions.

3. Under a new plan, the financial stress of property owners forced to relocate their homes has been eased. A property owner is now paid 25% of the purchase price upon signing an agreement of sale providing that amount does not exceed 75% of his equity. By this means, a property owner is provided cash to aid him in acquiring a new home or place of business.

4. A regular routine has been set up for disposing of 35 years' accumulation of excess of land adjoining highway rights-of-way which are not needed for highway purposes and putting them back on the public tax rolls. Public auctions are also held regularly to dispose of buildings acquired on new right-of-way. The Division's operations have had reviews by professionals as well as by the Bureau of Public Roads. New procedures, checkmates and forms have been adopted. The Right-of-Way Division reports direct to the Commissioner.

5. The Department has created a unit to provide Advisory Relocation Assistance to those displaced by construction, and also pays a portion of moving costs.

Safety

1. The Department's safety program was expanded to include inspection of construction projects to safeguard the motoring public. It includes advance warning signs, barricades, lights, uniformed traffic directors and similar safeguards.

Research

In cooperation with leading manufacturers and national scientific and technical organizations, the Department has expanded its development and testing of new materials and devices. Examples include:

1. Experimental installations on Routes U.S. 1 & 9 and portions of the Routes 4 & 17 interchanges to test use of electric cables buried in the pavement as a means of controlling ice and snow.

2. A program of controlled testing of a new device to measure the night illumination of traffic line paint.

3. Use of wire loops buried in the pavement to control and count traffic.

4. Use of nuclear measuring devices to calculate the density of soils and other sub-surface materials.

5. Use of specially designed metal mesh to prevent headlight glare.

6. Use of plastic strips in place of traffic line paint.

7. In conjunction with Stevens Institute a study on the safety and economic aspects of concrete center barriers.

8. In conjunction with the Newark College of Engineering development of a device to measure skid resistance of pavement surfaces.

9. A study of preventative maintenance practices to reduce highway maintenance costs.

Urban Planning Studies

1. Penn-Jersey. This study, undertaken in cooperation with the Pennsylvania State Highway Department and the U. S. Bureau of Public Roads, is designed to develop an adequate transportation system for a nine-county metropolitan region.

It covers Burlington, Camden, Gloucester and Mercer Counties in New Jersey and Bucks, Chester, Delaware, Montgomery and Philadelphia Counties in Pennsylvania. The basic data for the $4 million study has been collected and is now under analysis. A report will be issued this year. The information will then be kept current by continuing investigation in future years. Population and motor vehicle density maps were issued in 1962.

2. Newark. A full study of the transportation habits and facilities of the Newark metropolitan area was completed and a detailed report issued in 1961. Recommendations regarding rehabilitation of the area around the Pennsylvania Railroad Station were of particular interest.

3. Atlantic City Transportation Study. The Highway Department is now in the process of formulating the procedure and staff requirements for such a study. Present plans indicate it will be a joint effort of the Bureau of Planning and Traffic of the Highway Department and the Bureau of Planning of the Department of Conservation and Economic Development. Temporary employees will be utilized as required. The data collection phase of this study must be completed during the summer and fall of 1964 in order that sufficient time will be available to analyze these data to the extent that by July 1965 highway design in this area will be predicated on the information obtained from this study.

Estimated cost of this study during the first year will be approximately $400,000. Continuing study monies for this purpose will be required in future years, however, since the continuing phase consists merely of up-dating the initial data, the cost per year to operate this study will be substantially less than the initial year's cost.

The Atlantic City Transportation Study will be financed by the State Highway Department, the Department of Conservation and Economic Development, the Bureau of Public Roads and H.H.F.A. Portions of Atlantic County and Cape May County will be involved.

Urban Planning Studies, cont'd.

4. The Northeastern New Jersey Transportation Study was instituted in 1963. It covers Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Passaic, Somerset, Morris and Union Counties.

5. Tri-State Transportation Committee. This group was formed by the Governors of Connecticut, New Jersey and New York in August 1961 to examine the transportation problems facing the Nation's largest urban complex. The Committee, on which New Jersey is represented by the State Highway Commissioner, was directed to take such immediate steps as were feasible as well as to make recommendations for long range action. Moves to date include recommendations for several "pilot projects" which would be partially financed with Federal Aid. The first, a "park and ride" facility on the Pennsylvania Railroad near New Brunswick was opened in 1963. The Committee is making use of data collected by the Bi-State Transportation Agency on the problem of rail freight movements in New York Harbor and expects to derive much benefit from the Northeastern New Jersey Transportation Study.

Transit

1. In advance of the shutdown of the West Shore Division of the New York Central Railroad and the ferry which transported its passengers across the Hudson River into New York City and back, the Commissioner made suitable arrangements with bus lines serving the area so that when the shutdown occurred, no commuters were inconvenienced.

2. Upon creation of the Division of Railroad Transportation, the Commissioner negotiated contracts with all major commuter lines ensuring continuation of 96 per cent of the essential passenger service in the State. The cost of this program, amounting to between $5 million and $6 million a year, is less than the construction cost of one mile of modern freeway in an urban area. It has stimulated the carriers to help their own situation.

3. After prolonged negotiations, in which the Commissioner represented New Jersey, legislation was enacted directing the Port of New York Authority to acquire, rehabilitate and operate the Hudson & Manhattan Railroad in conjunction with construction of a World Trade Center on the west side of Manhattan, in the area of the present H & M terminal. Largely as a result of the Highway Department's insistance, this program includes provision for transfer stations in the Jersey Meadows to link up with New Jersey commuter railroads, a new bus terminal in Jersey City, and commits the Port Authority to spend up to an estimated $10 million a year on mass transit, even as a deficit operation.

4. Similar negotiations with the Erie-Lackawanna Railroad, the City of Passaic and the State Public Utilities Commission resulted in removal of the existing railroad tracks in the city, re-routing the railroad, and using part of the railroad right-of-way for highway purposes. A major portion of the cost was borne by the Public Utilities Commission.

5. A comprehensive study was completed of the moves required to revitalize mass transit in New Jersey and the cost. This program, in contrast to other schemes presented in past years, was based on economical use of existing facilities to allow the railroads to reduce operating costs insofar as possible and still improve service for the vast majority of passengers. The total cost to be paid by the Federal Government, the State and the carriers was estimated at $127 million, which puts the program within practical reach.

Semi-Autonomous Agencies

The Commissioner was designated as the Governor's liaison with all State and Interstate Authorities active in the field of transportation, including the Port of New York Authority, the New Jersey Turnpike Authority, the New Jersey Highway Authority, the Delaware River Joint Toll Bridge Commission, the Delaware River Port Authority, and the Palisades Interstate Parkway. In addition, the Commissioner has personally represented New Jersey as a Member of the Delaware River Joint Toll Bridge Commission, the New York-New Jersey Transportation Agency, and the Tri-State Transportation Committee. As a result, many new programs of benefit to the citizens of the entire area have been put into effect:

1. Delaware River Joint Toll Bridge Commission. The Commissioner was appointed a member of this Agency in 1955 and promptly instituted an investigation which uncovered evidence of widespread irregularities in the conduct of the Commission's affairs. These were corrected and the operations of the Commission reorganized, with the result that budgets were reduced, bond

retirements were accelerated, service to motorists improved, and many capital improvements made possible. Money improperly paid to some officials was recovered.

2. Delaware River Port Authority. In the wake of great controversy over the design and location of a rapid transit line from Philadelphia to Kirkwood, the Commissioner negotiated with the Authority and local officials and secured agreement to a modification which makes it possible to greatly improve some of Camden's problems.

3. New Jersey Highway Authority. After long negotiations with the Authority, bankers, investment firms and engineering consultants, the Commissioner prepared and ultimately secured legislative approval of a $40 million Parkway bond issue which is being used to finance construction of the Essex East-West Freeway (Interstate Route 280) as a depressed route through Newark and the Oranges, construction of an interchange with the Garden State Parkway in East Orange, and improvements to the Parkway in Essex County. This will improve the overall financial situation of the Parkway and provide some $13 million toward construction of a free highway.

The Commissioner, again acting as the Governor's agent, developed a solution to location of a new interchange in Monmouth County.

4. The New Jersey Turnpike Authority. The Commissioner has provided liaison, in several areas including that of real estate acquisition and the location of new interchanges, between the Turnpike and other agencies such as the State

Division of Motor Vehicles, the Hudson County Produce Market, Newark Airport, the Lincoln Tunnel and the Goethals Bridge (all controlled by the Port of New York Authority), and many communities.

5. Port of New York Authority. When plans for double-decking the George Washington Bridge were unveiled an agreement was obtained under which the Authority is paying $25 million toward the cost of the Bergen-Passaic Expressway leading to the bridge. It is understood that any surplus will be used on other Bergen County highways feeding the bridge. By using all of these Port Authority funds to match Federal Aid, the State is obtaining more than $100 million in road construction at no expense to the State Treasury.

In 1961 the Highway Department conducted two independent studies leading to a determination by the Governor that jet airplane service on a limited basis could be instituted at Newark Airport and emphasizing the value of an expanded and completely modernized airport to the city of Newark and the surrounding area.

6. After many negotiations with officials of the State of Delaware, the Commissioner secured an agreement under which the Delaware Memorial Bridge will be operated jointly by both States, instead of Delaware alone, in conjunction with new bridges, tunnels or ferries. A new Delaware River Bay Authority was set up to represent both States.

7. At the request of local officials, particularly those representing Atlantic City, exhaustive studies were undertaken to determine the feasibility of a toll road from a point south of Camden to the shore. As a result, legislation was adopted setting up the Atlantic City Expressway Authority to build and operate a toll road according to the route and design developed by the Highway Department.

General

1. The Commissioner acted as Flood Coordinator during the devastating Delaware River floods of August 1955. In this capacity he coordinated the emergency relief work of all public agencies, both State and Federal.

2. As the Governor's representative, the Commissioner negotiated with the owners of the Chester-Bridgeport Ferry across the Delaware River with the result that under new legislation, recommended by the Department, this service continued in operation under a subsidy from the States of New Jersey and Pennsylvania.

3. Under special legislation, the Department was able to prevent complete demolition of the historic Green Sergeants Bridge near Sergeantsville and a completely restored structure was opened to traffic in September 1961.

General, cont'd.

4. In the wake of the March 6-8 storm along the Atlantic seacoast, the Department moved approximately 500 men and more than 350 pieces of equipment into action to aid distressed communities. The effort continued until all local streets were cleared of debris and sand, which was completed well in advance of the summer vacation season.

5. A special Disaster Survey of Sea Isle City, listing the damage to that community and outlining a proposed protective "buffer strip", was presented to the Governor five days after he requested the information. The Department later appraised property which would be required for or rendered worthless by a new sand dune under construction by the U.S. Army Engineers and negotiated for these properties on behalf of the communities concerned. In all, some 800 parcels were involved.

6. As part of the overall shore rehabilitation work, the Department prepared another special report to the Governor on the possible use of sunken surplus ships for breakwaters and jetties.

7. A continually revised series of colorful and informative "Official State Map and Guide" booklets was distributed throughout the eight year period. The new booklet format was reported as extremely convenient for motorists to use while driving. Demand far exceeded the supply of every issue.

RECENT MAJOR PROGRAMS

ACCOUNTING MODERNIZATION PROGRAM

January, 1964

The report of the Governor's Committee on Efficiency and Economy in State Government issued in January 1963, under Section II Administrative Management, noted: "There is insufficient departmental activity in conducting administrative management and program studies, and in the installation of improvements. There should be a continuing study of programs, organization, performance, and procedures by all the departments of State Government. Administrative improvement staffs and programs should be developed to cover all departments. The wider use of independent and qualified consultants should be encouraged for such studies." In the same section, the report also encouraged the wider use of electronic data processing.

Early in 1962, the New Jersey State Highway Department determined upon an overall modernization of its existing accounting systems. At that time, the Department's Auditing and Accounting Bureau was responsible for the production of a Quarterly Financial Report which ran to some 116 or more different schedules. All of these various financial tabulations were written out by hand, typed, photographed, and reproduced in a very lengthy and time-consuming process. Due to the tremendous amount of individual labor involved, the report rarely was ready earlier than three months after the effective date of the figures it contained. The construction funds were reported on an account

number basis, so that it was difficult to relate any particular item in the accounts with the same item in one of the annual construction programs approved by the Governor. Operating accounts were reported on a cost basis, so that it was difficult to establish any relationship with the Governor's annual budgets.

The modernization of the Accounting Department has occupied a great deal of the Department's attention and many reforms have already been put into practice. The review and constant improvement is continuing and will culminate with promulgation of a complete and entirely new account manual this summer.

The following is a resume of the work completed to date, as well as that currently in progress and still remaining to be done:

Projects Completed

Initially our efforts were concentrated on the accounting procedures relative to the capital construction program, and more specifically to an accounting for funds (State appropriations and Federal-Aid allotments) used within the program. At that time, the existing records reflected only the balance of combined state and federal funds by state appropriation account number. An analysis of all transactions in the open appropriation accounts was made to ascertain the breakdown of the unencumbered balance between State and Federal Funds. As of March 31, 1962, the Federal balance was agreed to the Bureau of Public Roads record of total Federal Allotments.

To maintain an accurate balance of unencumbered Federal funds on a current basis, the "Federal Funds Control Ledger" was established.

This lists the Federal balance for all Federal-Aid projects, which is reduced whenever a commitment on a Federal project is made in the Construction Program Ledger.

As of March 31, 1962, a conversion of the Construction Ledger was made from an "appropriation account number" basis to a "construction program year and item number" basis. As a result of this conversion, we are able to maintain a ledger which records all transactions pertaining to capital construction in a form comparable to the original approved Construction Program set up in the fiscal year in which the appropriation was received.

In addition to the above, the related subsidiary ledger of commitment balances was indexed by program year and item to provide an unbroken record of the status of funds for each item in the construction program, beginning with appropriations (State-Federal), commitments or encumbrances against these funds, and expenditures against the commitments.

Formerly at the end of each quarter, an "Expenditure" and Commitment" report was published by the Highway Department containing in Route and Section number order, a detailed report of current year's activity and balance of appropriation, as well as a report of current year's expenditures and balance of commitments.

As of March 31, 1962, the balances in the above accounts were converted to a tabulating machine operation to permit publication as a monthly report, containing both construction year and item number as well as route and section.

In the early part of June 1962, the New Jersey Highway Department decided to apply to the Bureau of Public Roads for the adoption of a new billing procedure known as "Concurrent Audit and Billing". Under this method, a billing is prepared monthly for all expenditures made on federally reimbursable projects, and submitted to the federal government for immediate reimbursement subject to subsequent audit.

Adoption of the proposed plan was accomplished in a record four-week period. The Bureau of Public Roads made a thorough review of Highway Department accounting practices and procedures which included an accounting manual for operation of the Construction Ledger, chart of accounts for the various general ledgers, flow charts relating to the various divisions within the department wherein expenditures are incurred, and explanations of forms used. Effective July 1, 1962, the Highway was operating under the Concurrent Audit and Billing Plan. (A formal agreement was signed between the New Jersey Highway Department and the Bureau of Public Roads effective July 1, 1962.)

Mechanization of information required for the Federal-Aid Status Reports (formerly the Federal Funds Control Ledger) which will be used to control amounts obligated by the Bureau of Public Roads on all Federal-Aid projects, expenditures made by the Highway Department, and reimbursements received or receivable was rapidly completed. A monthly run-off which is included with the monthly concurrent billing became part of the normal data processing procedure.

An IBM "407" tabulating machine was installed on September 20, 1962, as a supplement to the existing "402" system. This machine provided a much wider range of functions and greater latitude in the programming of machine operations at increased speed and efficiency. However, this machine was fully utilized in a short time for new reporting requirements. A detailed feasibility study determined that a computer installation was required to meet the Highway Department's needs.

After careful analysis of available equipment which could process the Highway Department's somewhat unique flow of information, an IBM 1401 computer with related equipment was placed on order and scheduled for delivery in October 1963. Meanwhile, a Bureau of Data Processing was created in the Division of Accounting and Administrative Services, a manager of wide experience was appointed, and a staff selected and given preliminary training using computer installations available at nearby locations.

Space was made for installation of the accounting computer on the first floor in the same wing as the engineering computer. With the addition of subsidiary equipment now on order, the two computers will be fully compatible, thus allowing flexibility of operation which might not otherwise be possible.

When the accounting computer arrived, work began on conversion of all existing data processing procedures and reports to computer programs. The bulk of the schedule reports have been converted and are now being processed in routine fashion, however, work is continuing on the preparation of additional computer applications. The speed and flexibility of this device have opened up entirely new horizons in the area of reporting and management analysis, and it is extremely doubtful that work of this organization will ever become static.

For example, an entire new system of cost accounting reports for maintenance and electrical work has been developed on the basis of fiscal inventory taken June 30, 1963. Mechanized reporting in this area of the Department's activity is also available.

Mechanization of the Appropriation Accounting Ledger has been completed. This is a key report for the management of the Highway Department since it is the basis of all budget control and provides the truest picture of performance as against the mission outlined by the annual budget.

A statement of condition, status of funds, new account titles and account numbers for each of the four funds currently maintained have been prepared. The format and account structure is in conformity with the "Manual of Uniform Highway Accounting Procedures" which was adopted by the American Association of State Highway Officials. Recommended changes in accounting procedures have also been instituted on a continuing basis as required. The general ledger was opened as of July 1, 1962, in accordance with the new detailed chart of accounts. A manual has been prepared by the Assistant Comptroller showing each of these accounts with necessary explanations.

Procedures and memoranda applicable to public utility audits have been reviewed. A general audit program is currently being devised. Training of the New Jersey State Highway Department audit personnel to accomplish such audits is currently in process in conjunction with the Bureau of Public Roads. These audits will serve as the basis for future audits by the New Jersey State Highway Department's Bureau of Auditing.

The concurrent billing procedure with the Bureau of Public Roads in July of 1962 has created a conservative estimated savings of $143,500 annually for the State Treasury. (The previous system of submitting progress vouchers for construction expenditures and the resulting audit by the Bureau of Public Roads generally resulted in reimbursement to the State in about six months from the date of expenditure. A minimum billing of the federal portion is $5,000,000 monthly at 3½ percent interest per annum for six months is a savings of $87,500 annually. Prior to the concurrent billing system, incidental expenditures were submitted for reimbursement at the conclusion of a construction project. Using two years as an average completion time for a project, the annual amount of $1,600,000 at 3½ percent interest per annum for two years is a savings of $56,000 annually. Therefore, the combined estimated conservative savings is $143,500.

As an example of indirect savings, during fiscal 1962, a monthly mechanically produced report of Construction Appropriation Balances designated by Program year and item number and related Commitment Status Report was initiated. Management began receiving these reports on a timely basis each month as of September 1962. Prior to this date, only a manually prepared quarterly report was issued. Employing the same information used to prepare the monthly mechanically produced Commitment Status Report, beginning with September 30, 1962, the quarterly Commitment Status Report was also prepared by tabulating equipment.

The inauguration of the monthly reports represent additional reporting which, if prepared manually, would have required an average of 15½ man days for preparation and 15 man days for typing each month. With present tabulating equipment, 5 man days are required for publication of these reports.

It is difficult to measure the amount of dollars saved, inasmuch as the new reporting not only replaces existing manual practices but also adds new reports either in frequency or kind. It is this unknown which requires consideration in computing what additional costs would be involved if expanded reporting was contemplated on a manual basis. It is important to note that in a data processing system any increase in volume as a result of an expanded Construction Program or availability of additional funds will not present any problem due to increased activity.

FISCAL YEAR 1962-63
Concurrent Audit Billings
To Bureau of Public Roads

	Month	Date Billing Received	Amount Received From B.P.R.
	1962		
Concurrent Audit Billing #1	July	8-15-62	$ 764,254.86
#2	August	9-25-62	5,364,886.67
#3	September	10-25-62	3,766,571.98
#4	October	11-29-62	6,004,681.01
#5	November	12-27-62	5,228,000.18
#6	December	1-23-63	3,932,333.84
	1963		
#7	January	2-27-63	2,618,723.22
#8	February	3-2-63	4,147,325.98
#9	March	4-2-63	2,790,726.26
#10	April	5-24-63	6,159,879.28
#11	May	6-25-63	8,585,543.97
#12	June	7-26-63	8,673,337.49 *
			$ 58,036,264.74

*Note: Billing Submitted - Cash Not Received 7-29-63

Federal Aid Cash Received
For July 1, 1962 to June 30, 1963

Primary & Urban	$ 10,051,341.43
Interstate	54,819,710.56
Sub-total	$ 64,871,051.99
Secondary & Feeder	2,246,366.29
TOTAL	$ 67,117,418.28

Above represents combined receipts during Fiscal 1963 from Concurrent Billing and Progress Vouchers. In addition, receipts of $8,673,337.49 billed in June and July are anticipated daily.

Decentralization
Division of Maintenance and Operations

The several benefits realized to date are enumerated herewith not necessarily in order of value:

1. Trenton headquarters has been relieved of operational details. Had the buildup of activity continued under former organization headquarters would have choked up and work accomplishment would have been slowed down.

2. District offices have become more sensitive to district needs, more versatile in serving these needs, gives faster solution to problems.

3. Public relations have been furthered to a very considerable degree. This benefit comes mainly from faster handling of complaints. As our district offices become better known more complaints go directly to them, which by policy set down they service quickly and contact complaining party. Complaints in turn make district offices more sensitive to trouble spots.

Complaints received in central office can now be deployed four ways, and are serviced faster by the districts than they formerly were by central office personnel working out of Trenton.

4. Decentralization of permits has vastly speeded up the permits procedure. It has also made simpler the task of the applicant when he requests a permit.

5. Reorganization has by its nature caused District Superintendents together with central office to review alignment and assignment of highway sections and areas. Updating of assignments has resulted so that we now feel we have equal distribution of work loads.

6. Decentralization of snow and ice control to district offices has expedited this work and made it more responsive to local conditions. It has placed greater responsibility not only on district offices but on individual supervisors and foremen for better manpower control and materials conservation.

7. Lines of communication have been shortened. Improved communications have been stimulated. For example, teletype service to Newark, direct telephone lines to Freehold and Cherry Hill, daily station wagon service between Newark and Trenton.

8. Decentralization of skilled labor formerly centralized in Trenton has reduced traveling time and effected pavroll and equipment savings.

9. Maintenance construction has been expedited by decentralizing construction crews.

10. Our people are giving more attention to new construction with the district forces increasingly visiting new construction work and keeping it under serveillance through construction stages. The concept of district responsibility has made our people aware of the relation between new construction and future maintenance. It has been possible for our district people, particularly the engineering personnel, to make constructive suggestions to Location and Design offices.

11. With all maintenance and operations activities under coordination at district level, coordination on maintenance construction jobs has been greatly simplified whereas formerly activities of the three division bureaus had to be coordinated at the bureau chiefs level. These now can be coordinated with greater ease in the District Superintendent's office.

12. More awareness of the need of effective equipment utilization has come within the district, and has stimulated reports and interest leading to getting more working hours out of our equipment.

13. Introduction of inventory reports requested by the division and worked out with the Bureau of Auditing and Accounting and Peat, Marwick and Mitchell has stimulated interest in material conservation and reduced inventory. It is now possible to find where stocks of material are, and to make advantageous transfers of inventory from one location to another.

14. Superintendents meetings instituted at the outset of the reorganization have proved and invaluable form for exchange of ideas. Since no attempt to impose uniformity on the districts has been exerted,

except to the degree necessary to coordinate operations and present a uniform policy and face to the public, the freedom of the districts to originate and to bring to the meetings reports of their innovations has been a stimulation to all. Whereas formerly we "master-minded" from one source, we now have four districts and headquarters thinking independently and pooling ideas.

15. Decentralization has stimulated interest and work within the Division of Maintenance and Operations, and has presented a challenge particularly to all supervision and administration. Decentralization was received with skepticism by many and some skepticism still remains. Criticism goes on, but this has been readily solicited as a constructive act, but indications are that a poll of our supervisory group would show an overwhelming approval of decentralization. This concept of progress on the part of our people is probably the greatest benefit resulting from this program.

ENGINEERING COMPUTER

The Highway Department's Engineering Computer Bureau completed its first full year of operation in January 1964. Aside from developing more than 40 different programs for the computer, the most important accomplishment was the progress made in orienting the Department's engineers to use of the computer. This was accomplished by giving seminars to familiarize the engineers with the various programs, for example, use of the computer to analyze slope stability. Four seminars were conducted during 1963 and more are scheduled for the current year.

One of the more important computer programs developed by this Bureau during the year was the Critical Path Schedule for the Interstate System. This program outlines the various times when all of the work elements associated with completion of the Interstate System should be started in order that the entire system may be completed by 1972. It pinpoints delays which would, if not overcome, impede progress to the point where the system might not be completed on schedule. In general, this is one of the most important management tools developed utilizing the engineering computer.

During 1964, this Critical Path Schedule will be made even more sophisticated, and a number of other programs will be developed as shown on the attached schedule.

An analysis of the differences of performing various calculations by the manual methods formerly in use and with the computer demonstrates substantial savings have been achieved.

For example, the geometric calculation involved in the average highway interchange requires about nine weeks less work time with the computer, at a saving of approximately $2,665. The average bridge requires about six weeks less work time at a saving of $1,705.

The calculations involved in bridge walls can be completed in about three months less work time using the computer at a saving of $3,551. Similar savings are realized on other types of work and is estimated that in one month the computer installation can do work which would require almost a year (utilizing the same personnel) at a saving of almost $16,000. When the cost of the computer installation is taken into account the net saving in cost amounts to $6,870, not including the value of the time saved.

Using the computer to determine the annual truck weight tables, instead of the tabulating machines formerly available, permits work to be done in two months which formerly required 18 months utilizing the same personnel.

Computer Programs used for Design

All programs listed are for use with an IBM 1620 60K card computer with indirect addressing, additional instructions and auto-divide. The Bridge Programs were converted from Bell IBM 650 using the three address interpretive system.

Roadway Design Programs

1) Geometrics (One Program)

   A. Traverse Computations
      Solves any traverse having 2 unknowns and stores answers

   B. Horizontal Curve
      Solves for station on curve given bearing or solves for bearing to P.O.C. given station

   C. Coordinate Conversion
      Solves for new coordinates given old coordinates and rotation angle

   D. Traverse Adjustment
      Adjusts traverses by either the compass or transit rule and calculates area, if required, including area of circular segments

This program is used for interchange computation and bridge geometry.

2) Profile Grade Program
   Computes profile grades on tangent or vertical curves and gives PVC, PVI, or PVT and low or high point

3) Pavement Elevations
   Calculates pavement and subgrade elevations

4) Curve Data
   Calculates horizontal curve data including tangent, length, external and deflection in minutes per foot. The program will also compute deflection angles

5) Design Earthwork
   Given the existing terrain and design information, computes template, slope stake and earthwork volumes

6) Slope Stability Analysis
Given the coordinates, weights and other factors, uses the method of slices to calculate the safety factor of an embankment

Bridge Design Programs

1) Composite Beam Designs

A. Welded Girders

B. Rolled Beams

C. Prestressed Concrete Beams - Pretensioned, straight strand

D. Prestressed Concrete Beams - Post-tensioned, draped cable

The above series of composite beam programs provide comprehensive designs and analyses of the various members listed. Final designs are achieved primarily by trial and error methods and satisfy the current requirements of the AASHO Bridge Specifications. Virtually complete designs are produced such that most of the results may be transferred immediately to the contract plans.

2) Rigid Frame Concrete Bridge Pier
This program provides a complete design and analysis of a 3 bay rigid frame concrete bridge pier. The program allows initial determination of a satisfactory footing size and then proceeds through a moment distribution analysis to ultimately determine stresses and reinforcement requirements. Included in the program is a subroutine which allows a cracked section analysis and design of a circular reinforced concrete column.

3) Abutments and Retaining Walls
This program provides a complete design and analysis for abutments and walls on spreed footings. Almost complete flexibility of wall configurations are allowed. The program determines footing sizes by incrementing the toe or heel, respectively. Final determinations of stress and reinforcement requirements are automatically provided for the wall footing and stem.

4) Bridge Geometry

A. Skewed Bridge Geometry

B. Curved Bridge Geometry

These two programs provide the means to determine dimensions and elevations required for the basic geometrical layout of bridge structures falling within these categories.

Proposed Future Applications in order of priority

1.

A. Design Earthwork.
This series of programs is almost complete. Work still remains to be done on the median design phase. Should be operational by March.

B. Information System.
This series of programs and the design of the necessary forms will be complete by April.

C. Traffic Assignment and Traffic Forecasting.
A series of programs that will assign traffic for our highway network. The programs are based on the Bureau of Public Roads 7094 program but are smaller in node capacity. Traffic Forecasting will use either the Gravity Model or Fratar Method. Forecasting of traffic for the 104B interstate estimate will be the first test.

D. Statistical Analysis.
A series of statistical programs for use by the laboratory.

E. Route Sufficiency Ratings and Road Life Report.
Program development is underway.

F. Prestressed Box Beams.

G. Welded Girder (650 simulated).

H. Box Culvert design, single and double.

2.

A. Drainage Analysis.
A series of 2 or 3 programs that will provide for the analysis of storm sewer or open channel systems.

B. Annual Average Daily Traffic Series.
A four program series which will take field count data by vehicle classification and generate station averages, route section averages, AADT and DHV volumes and other reports. Should be completed by Sept., 1964.

C. Bituminous surfacing volumes.

D. Pavement design.
Bituminous Pavement design using both economic and axle loading criteria.

3.

A. Soils Settlement Analysis and Prediction.

B. Traffic Signal Synchronization.
This program will synchronize a traffic signal system for minimum delay time.

C. Benefit Cost Ratio Program.
Program will compute ratio of road user benefits to cost of facility.

D. Accident Analysis.
This program now exists, but should be revised to include specific ramps and other locations.

E. Continuous Beam Design.

4.

A. Interchange Earthwork.
Program to calculate interchange earthwork by the slice method.

B. Traffic Simulation.
This is an experimental application. Simulation of traffic on an interchange or on a traffic signal network would give us information before final design stage.

C. Right of Way Appraisals.

D. Right of Way Comparable Sales Data.

E. Operation Research Applications.

F. Curved Bridge Design.

RIGHT OF WAY

One of the most important activities of the Department is acquisition of right-of-way for highways. This is also one of the most sensitive areas as far as public opinion is concerned and one of the most critical areas from the standpoint of protecting the taxpayers against fraud and undue "profiteering" on the part of property owners, real estate speculators, etc. For these reasons, great attention must be given to insuring that our right-of-way acquisition procedures are entirely free from any taint of wrong-doing, that all transactions are completely documented, and that all prices are arrived at on the basis of thorough and honest appraisal of fair market value.

The tabulation below indicates the increase in volume of owners dealt with, as well as the cost of right of way from 1956 through 1963.

Year	Number of Owners	Number of Parcels	Amount Expended
1956	517	662	$ 4,376,734.20
1957	583	745	8,351,368.36
1958	850	1060	10,699,772.38
1959	1036	1401	12,937,877.18
1960	1216	1508	18,913,388.28
1961	1747	2191	24,885,792.01
1962	1146	1447	23,096,746.01
1963	1327	1563	20,056,072.50

It is to be noted that in this period the number of owners from whom property was acquired and the number of parcels acquired more than doubled, and the amount of money increased approximately 5½ times. The increase in cost is due largely to the fact that most of the property acquired was located in urban areas.

of Way Division had to absorb an unusual number of new federal requirements, including advisory relocation assistance, partial payment of moving costs, improved appraisal guide lines and provision for appraisal review and establishment of fair market value.

As a result of upgrading these operations, the production of appraisals and settled cases was retarded to a considerable extent, as can be seen from the figures from 1962 and 1963. This is not a situation peculiar to New Jersey. The Bureau of Public Roads, anxious to fully protect the federal interest, is insisting upon a higher quality of appraisal and better documentation throughout the nation. In some other States it is understood that the difficulties of meeting the new federal requirements brought appraisal of right of way almost to a complete halt.

Production of appraisals substantially increased during the latter half of 1963 and January figures projected over a year indicate that the Right of Way Division is currently operating at an annual expenditure of about $23 million and a volume of 2,000 cases yearly, which reflects approximately 2,500 parcels.

During the first week of February, 1964, the fair market values set increased to an average of 51 cases per week. This figure, if projected over 52 weeks, would indicate 2,600 cases annually and about 3,300 parcels.

It is believed that production will flatten out at about a 3,000 parcel annual total and cannot be increased much further without the extensive education and the expansion and operational recommendations which have been made in the Department's budget recommendations to the Legislature.

In considering the accomplishments, production-wise, of the New Jersey Right of Way Division, it is important to know that highway work to date has been concentrated primarily in urban areas which affect complicated improved properties, whereas most other States have worked in rural vacant land areas. Even so, it is believed that by comparison New Jersey out-produces California's 1,400 Right of Way employees by better than a two-to-one basis.

As of October, 1963, the Right of Way Division had 4,750 cases on hand plus 650 in condemnation status.

A review of the 1963-1964 and the 1964-1965 construction programs indicates that it would be fair to estimate an additional case load in the coming year of about 7,000 cases.

In 1956 the staff of the Right of Way Division amounted to 88 individuals, of whom 30 were in the Bureau of Appraisal and Negotiation and 36 were in the Title Bureau. In 1963, the staff of the Right of Way Division amounted to 217 individuals of whom 152 were in the Bureau of Appraisal and Negotiation and 43 were in the Title Bureau.

It is interesting to note that the Division's production both parcel-wise and case-wise has increased by almost 600 percent while the number of employees have not increased proportionately.

Because of the ever-increasing workload, the procedures and requirements specified by the Federal Bureau of Public Roads in connection with the documentation of all appraised valuations, etc., it became absolutely vital to increase our personnel by the establishment of a fifth District Office. This office is located in Trenton. It may be necessary, perhaps in 1964, to establish a sixth District Office.

The Division has established a Property Section within the Bureau of Appraisals & Negotiations. The Property Section Office conducts auction sales of all excess parcels of land and disposes of structures of all types to the best advantage to the State.

The Division's new Property Section disposes of excess land as rapidly as possible and also advertises buildings for sale at auctions prior to the start of construction. In its first year of operation, the Section estimated that it had gained more than $383,000 for the State.

In accordance with the Federal Government's 1962 Highway Act and in accordance with New Jersey law, an Advisory Assistance and Relocation Payment office was established for persons affected by acquisition of rights of way for Federal Aid Highway purposes.

New Jersey's Guide Lines covering this service and other data prepared by the Division of Right of Way Acquisition & Titles was recently commented upon at the American Right of Way Association Seminar at Atlantic City by Federal Bureau personnel as an example for other States to follow.

The Division's existing Appraisal Guide Lines as well as the operating procedures concerning fee appraiser contracts and fees were completely revamped.

During 1961, the New Jersey State Highway Department Right of Way Division was called upon by AASHO Right of Way Committee to assist in the preparation of their new text book, "Acquisition for Right of Way". We prepared the chapter pertaining to appraising for condemnation. This text book was prepared by AASHO for use in on-the-job training for Right of Way personnel throughout the entire country. The chapter is designed with illustrations that we considered of benefit for easy understanding of the text.

An Economic Research Section has been established which is studying the effects of our acquisitions on remaining property values. In cooperation with the Federal Bureau of Roads, several days were spent in the State of Connecticut Highway Department explaining the procedures in this regard to the various States within the Federal Bureau Region #1.

The purpose of the economic studies is to make case histories of the affect that new highway construction had on owners' remaining properties, particularly as to resale values. These studies are being made by several States throughout the country with the hope that eventually the Highway Departments will be able to show that the exorbitant damages claimed by owners in many

instances are somewhat mythical. Along these lines studies have been made of the effect of construction of highways either in deep cuts or high fills. There has been investigation of the economic impact on communities from the tax standpoint. The State prepared and reported to the Federal Bureau of Public Roads on 25 individual case studies. These case studies as well as those produced by other States are all transmitted to the Federal Bureau of Public Roads at Washington where a "bank" is established for the processing of data to every State in the Country. It is hoped that eventually it will be possible to convince appraisers, property owners, and the courts that properties are not being damaged to the extent claimed, by the construction of land service roads, and also by freeways.

Reorganization
Division of State Aid

The State Aid Division of the Highway Department consolidated its areas into four geographic districts January 1, 1964. Each of these four districts has a field office centrally located and staffed to handle the routine processing and administrative operations of the program that were formerly done in Trenton. Supervision of construction and liaison between the Division Office in Trenton and the local governing bodies is also a function of the District Office. The Division Office, Trenton, ceased to be the operational office and became the directing and coordinating office for the State Aid Road Program.

By moving the operational work involved in these programs closer to the projects and their sponsoring agencies, effectiveness will be increased.

IN-SERVICE TRAINING

In-service training activities over the past several years have not been nearly as ambitious as might be desirable, primarily because of the lack of staff personnel to plan and carry out needed training programs. While we have developed programs to provide orientation training for new personnel and some supervisory training programs, in most other areas our efforts have been directed primarily to encourage the various operating line divisions to develop their own programs to meet their specific training needs.

To review briefly some of the more significant training efforts, for the past four years we have carried out with the Bureau of Road Construction a series of training conferences aimed to improve the skills and knowledge of engineers and technicians who are engaged in the supervision and inspection of road construction work being performed for the Department by private contractors. This training effort has been concentrated during the winter months when construction activities are usually at their lowest ebb. During 1961 and 1962, two-day conferences were held in each of the Construction Districts. In 1963, this program was expanded to five days and presented locally here in Trenton. These conference sessions were attended by over 350 engineers and technicians from the Bureau of Road Construction and the Bureau of Testing and Materials. The subject matter covered ranged from sessions devoted to discussions of the general duties and responsibilities of the Inspector to conferences which presented specific instructions concerning the reading and interpretation of

plans and specifications and soils properties and classifications. Nine 5-day conferences were held. Instruction was provided primarily by experienced Principal or Resident Engineers, but outside assistance was obtained from representatives of the Bureau of Public Roads, the Portland Cement Association and the Asphalt Institute. This past year similar training was conducted by each Resident Engineer for his own engineering and technician support personnel at the respective field offices. With such individualized training, each Resident Engineer was able to provide a training program tailored to meet his own specific needs.

In cooperation with the Department of Civil Service and the State Department of Education, early in 1963 a training course in Highway Technology was instituted at the Union County Technical Institute as an experimental effort to determine the feasibility of developing such a program on a state-wide basis. This program, aimed at providing college level training in some of the basic highway engineering subjects, is now in its third semester, and appears to be working out satisfactorily. In this program, instruction has been provided in evening classes covering college mathematics, chemistry, physics, engineering drawing, strength of materials, and surveying. At the end of the current semester, it is our plan to evaluate the courses presented thus far to determine the advisability of expanding this type of training to other areas of the state.

An Orientation Training Program has been in effect for the past year whereby new employees in the Department are informed about those areas meaningful to them

to prepare them to assume their new duties with as much general employment knowledge as is possible as well as to provide specific instructions in their particular duties. It is a three-phase program carried out (1) by the Division of Personnel; (2) the employing Bureau or District Office; and (3) the new employee's immediate supervisor. An Orientation Manual is now in preparation and is expected to provide great help in this phase of training.

Two of the line divisions and bureaus who have conducted training programs for their own personnel which are deserving of special mention are the Division of State Aid and the Bureau of Testing and Materials. The Division of State Aid undertook and carried out very successfully a training program for all of their engineering and technical employees covering very comprehensively all of their activities.

The Bureau of Testing and Materials has always been extremely active during the winter months in providing new and refresher training for all laboratory and field personnel. This past winter, a significant number of their field testing personnel were given specialized training in the inspection of pre-stressed concrete members.

Supervisory training has been provided in the past for several divisions with most of our efforts in this respect being concentrated in the Division of Maintenance and Operations where there is an exceedingly large number of supervisory employees. Plans are now under way to renew this type of training in this division in April. Management and supervisory training will be

provided for all levels of supervision from the top down to and including the line foremen and assistant foremen.

With the introduction of the computer and the attendant engineering programing, an effort has been made to acquaint engineering personnel with the basic concepts involved. In February, 1964, a 3-day training program was presented to such employees. Instruction was provided by the I.B.M. Education Center and by Mr. George Woodruff, who is in charge of the Department's Engineering Computer Section.

The most comprehensive training effort undertaken by the Department is the program now under way to provide a 12-hour course in Civil Defense Adult Education for all Department employees. Instituted at the direction of the Governor on a state-wide basis, we participated originally in the program set up by the Department of Education for all State Departments. When it became apparent that the program might continue interminably because of the relatively small number of Department employees who could attend such sessions, it was decided to take on our own training job. Training since that time has been progressing at a more satisfactory rate. Eighty-two employees completed the training in February contrasted to the previous rate of about 12 per month. We still have a long way to go, but steady progress is being made.

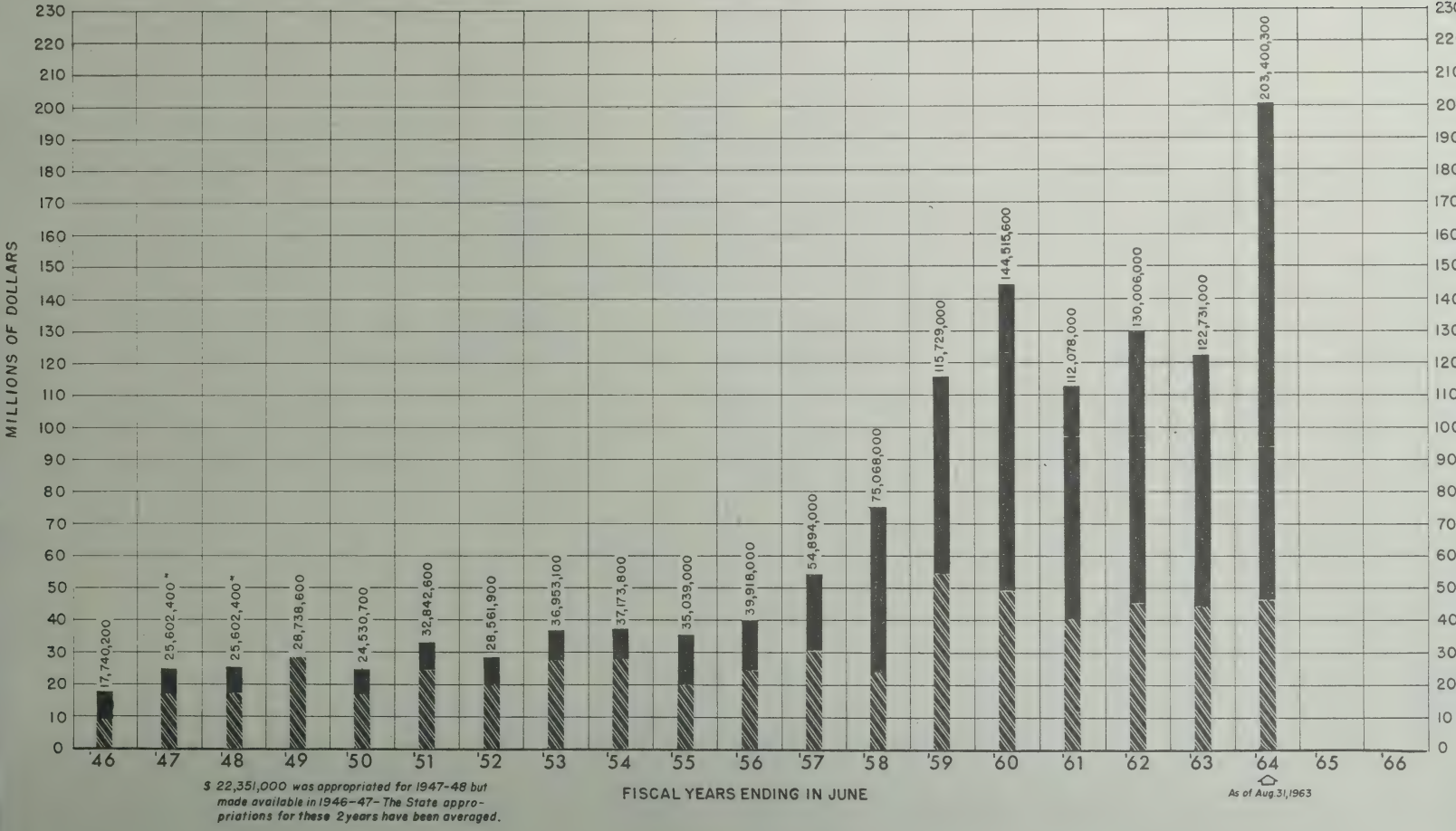
In addition to in-service training, many opportunities have been provided to selected Department employees to attend seminars and lecture programs presented by various colleges and universities, as well as those offered by such

CONSTRUCTION FUNDS

1946 - 1964

State Funds ▨ - Federal Funds ■

THIS CHART SHOWS CONSTRUCTION FUNDS AVAILABLE FOR THE YEARS INDICATED AS APPROPRIATED IN THE CAPITAL CONSTRUCTION SECTION OF THE BUDGET



$ 22,351,000 was appropriated for 1947-48 but made available in 1946-47- The State appropriations for these 2 years have been averaged.